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ABSTRACT

This study focused on the relationship of seven characteristics of effective schools (instructional leadership, environment, expectations for student achievement, schoolwide instructional goals and objectives, classroom practices, monitoring of student progress, and home-school relations); six demographic variables (school size, student socioeconomic status, student race, school location, tenure of principal, and sex of principal) and student achievement. Teachers in 70 out of 131 middle schools in Georgia completed the Connecticut School Effectiveness Questionnaire (CSEQ). Principals in these 70 schools supplied the demographic information. Student achievement was measured by the eighth grade Georgia Criterion Referenced Test (GCRT). The Pearson r was calculated using the scores of each of the seven variables and then the total mean score on the CSEQ. A Pearson r was also used to determine any relationship between demographic data and the GCRT. This procedure was followed by stepwise multiple regression analyses to determine the relationship of various combinations of these variables and the interaction of both the school effectiveness and demographic variables. Results indicate that a number of effective school and demographic variables are correlated with the three academic areas of the GCRT (reading, mathematics, total score). Findings suggest that schools can act to improve student achievement. (Author/JAM)

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SCHOOL EFFECTIVENESS CHARACTERISTICS AND STUDENT ACHIEVEMENT: A STUDY OF RELATIONSHIPS IN GEORGIA MIDDLE SCHOOLS

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Abstract

This study focused on the relationship of seven characteristics of effective schools (instructional leadership, environment, expectations for student achievement, school-wide instructional goals and objectives, classroom practices, monitoring of student progress, and home-school relations), six demographic variables (size of school, socioeconomic status of students, race of students, location of school, tenure of principal, and sex of principal), and student achievement. Teachers in 70 middle level schools in Georgia completed the Connecticut School Effectiveness Questionnaire. Principals in these 70 schools supplied demographic information. Student achievement was measured by the eighth grade Georgia Criterion Referenced Test (GCRT). Results indicate that a number of effective school and demographic variables are correlated with the three areas of the GCRT (reading, mathematics, total score). Results indicate that there are actions schools can take to improve student achievement.

Beginning with George Weber in 1971, numerous researchers have conducted studies designed to refute Coleman's (1966) argument "that schools bring little influence to bear on a child's achievement that is independent of his background and general social context" (p. 325). A Nation at Risk and the multitude of reports following it have severely criticized the quality of education offered to American youth and have generated further studies in what is commonly identified as "effective school" research. The need for continued research in Georgia was given added impetus in 1985 when the Georgia General Assembly passed the Quality Basic Education Act.

This study is a response to the mandate of the Georgia General Assembly to improve the school's climate and thus promote positive gains in student achievement scores. There is a need to know what characteristics in a school are related to students' scores on the Georgia Criterion Referenced Test. This study was also designed to respond to some of the concerns raised about the effective school research methodology. Thus, student achievement at the eighth grade level was considered, a level at which few previous studies have been conducted. Schools from the full range of effectiveness categories (effective, average, ineffective) were studied and consisted not only of urban but also suburban and rural schools.

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Review of the Literature

Although the exact characteristics of an effective school tend to vary from one study to another, there are seven characteristics that surface again and again:

(a) instructional leadership by the principal, who works closely with teachers to improve their instruction (Persell & Cookson, 1982), hires and maintains capable staffs (Duke, 1982), designs staff development programs planned around the needs of teachers (Purkey & Smith, 1983), and who is a forceful and dynamic leader (Robinson & Block, 1982);

(b) an orderly, peaceful and purposeful environment (Shoemaker & Fraser, 1981) established by the staff, often through the use of symbols (Curran, 1983);

(c) an atmosphere of high expectations (Curran, 1983; Azumi & Madhere, 1982) clearly communicated to the staff, the students, and the home (Clark, Lotto, & McCarthy, 1980);

(d) school-wide goals and objectives (Venezky & Winfield, 1979) determined by a consensus of the faculty and not merely handed down as "gospel" (Austin, 1981);

(e) classroom practices including emphasis on the basic skills of reading and mathematics (Brookover, et al., 1982), large portions of class time spent on instruction (Azumi & Madhere, 1982) with students engaged in quality activities (Squires, Huitt, & Segars, 1983), a school-wide policy requiring daily homework (Madaus, Kellaghan, Rakow, & King, 1979), and a variety of teaching styles and content responsive to the needs of individual teachers and students (Mackenzie, 1983);

(f) careful monitoring of student progress (Venezky & Winfield, 1979);

(g) the interest, support, and involvement of the community, and especially the parents (Teddlie, Falkowski, Stringfield, Desselle, and Garvue, 1984).

The findings of the effective school research have been fairly consistent from one study to another; several researchers, nevertheless, have criticized both the conceptual model of the effective school and the methodology used to arrive at conclusions. One concern is with the methods of identification (Frederick, 1987). These measures of school effectiveness, some critics argue, tend to be unstable (Rowen, Bossert, & Dwyer, 1983). Another concern is that the research has used specific grades to measure effectiveness and has not considered the school as a whole (Rowan et al., 1983). In addition, some researchers believe that the findings are difficult to generalize to all schools because the research tends to focus on small elementary schools serving the urban poor (Teddlie et al., 1984).

Thus, though numerous studies have reached the same basic conclusions about student achievement, the criticism of the methodology employed in these studies leads to additional questions. Consequently, further research is needed to respond to the criticism and to reaffirm the earlier findings through new methodology.

Hypotheses

The following hypotheses were developed to address the questions raised concerning the relationship between student achievement, school effectiveness characteristics, and demographic variables.

HO:1

There are no statistically significant correlations between students' mean scores on the Georgia Criterion Referenced Test (reading, mathematics, combined) at the eighth grade level and the following variables of school effectiveness (as measured by the Connecticut School Effectiveness Questionnaire) considered individually and collectively:

a. instructional leadership
b. environment
c. expectations for student achievement
d. school-wide instructional goals and objectives
e. classroom practices
f. monitoring of student progress
g. home-school relations
h. total

HO:2

There are no statistically significant correlations between students' mean scores on the Georgia Criterion Referenced Test (reading, mathematics, combined) at the eighth grade level and the following demographic variables considered individually and collectively:

a. size of school
b. socioeconomic status of students
c. race of students
d. location of school (urban, suburban, rural)
e. tenure of principal
f. sex of principal

HO:3

There are no statistically significant correlations between student achievement at the eighth grade level as measured by mean test scores on the Georgia Criterion Referenced Test (reading, mathematics, combined) and the aforementioned school effectiveness variables and demographic variables considered collectively.

Population of the Study

The population of this study included all 131 Georgia public middle schools containing grades 4-8, 5-8, and 6-8. This particular population was chosen for several reasons. First, the review of the literature found only two other studies conducted at the eighth grade level. Their methodology is different from that of the current study. Secondly, schools were chosen in which the eighth grade is an exit grade. One concern raised by Rowan et al. (1983) is that research studies consider achievement at only one or two grade levels. To compensate for this problem, the exit grade was chosen so that students would have experienced the curriculum and climate of the entire school instead of just one or two grades. Third, each school in this study included a minimum of three grades to afford ample time for the students to experience the climate of the school. Finally, the eighth grade is a level for which Georgia Criterion Referenced Test scores are available.

Data Collection Procedures

Each school in the population was sent a packet of materials including the following: (a) a letter of explanation with a request to participate in the study, (b) a School Data Information sheet designed to gather demographic data on the school, (c) Connecticut School Effectiveness Questionnaires for five teachers, and (d) directions for administering the questionnaire.

The Connecticut School Effectiveness Questionnaire is a survey instrument designed by the Connecticut State Department of Education to measure seven variables of school effectiveness by means of 100 statements of behavior or activities with a five point Likert scale for response. The questionnaire has been judged through statistical analysis to have content and construct validity and a total score reliability coefficient of .955.

The principal was asked to fill out the School Data Information sheet and to choose five teachers to complete the questionnaire. These teachers were chosen through a systematic sample - that is, every kth teacher from any available list was selected after a random start. It was determined that participation by the identified schools would be higher if the number of teachers involved in the study were limited to five. Envelopes in which to seal the responses were provided. Upon completion of all questionnaires, a staff person designated by the principal returned the material to the researcher. A second and third mailing were used to make every effort to ensure maximum return. Seventy schools responded to the survey.

Data Analysis

Student achievement was measured by test scores on the Georgia Criterion Referenced Test (GCRT). School effectiveness variables were measured by scores on the Connecticut School Effectiveness Questionnaire (CSEQ). Demographic information was gathered from the School Data Information sheet completed by principals. The Pearson r was calculated using the scores on the GCRT (reading, mathematics, combined) and the scores of each of the seven variables and then the total mean score on the CSEQ. A

Pearson r calculation was also used to determine any relationship between demographic data and the GCRT. In both instances, the procedure was followed by stepwise multiple regression analysis to determine the relationship of various combinations of these variables. Finally, stepwise multiple regression analysis was calculated by combining both school effectiveness and demographic variables to determine if there were interactions between the two groups of variables. A significance level of .05 was chosen.

The Findings

The null hypotheses were tested using these data analysis procedures. The results are summarized below and in Tables 1-5.

Relationship of Student Achievement and School Effectiveness Variables (HO:1)

There were statistically significant correlations between GCRT reading scores and environment, expectations for student achievement, home-school relations, and total score. GCRT mathematics scores had a statistically significant correlation with environment, instructional leadership (negative), home-school relations, and expectations for student achievement. GCRT combined scores were statistically significantly correlated with environment and home-school relations.

Table 1

Pearson Correlations between GCRT Scores and School Effectiveness Variables (HO:1)

School Effectiveness Variable	GCRT Reading	GCRT Mathematics	GCRT Combined
Environment	.37 (p = .001)	.30 (p = .005)	.35 (p = .002)
School-wide Goals & Objectives	.12 (p = .17)	.01 (p = .48)	.06 (p = .31)
Instructional Leadership	-.13 (p = .15)	-.31 (p = .005)	-.23 (p = .03)
Expectations for Student Achievement	.30 (p = .005)	.10 (p = .21)	.20 (p = .05)
Classroom Practices	.08 (p = .25)	-.002 (p = . 49)	.04 (p = .37)
Monitoring Student Progress	.03 (p = .39)	-.09 (p = .24)	-.03 (p = .41)
Home-School Relations	.46 (p = .000)	.34 (p = .002)	.41 (p = .000)
Total	.24 (p = .02)	.08 (p = .26)	.16 (p = .09)

Note. 1 tailed significance

When school effectiveness variables were combined, home-school relations and instructional leadership had a statistically significant multiple regression correlation with GCRT reading, GCRT mathematics, and GCRT combined scores. When environment was added to the formula, there was a significant multiple correlation with GCRT mathematics.

Table 2

Stepwise Regression for School Effectiveness Variables and GCRT Scores (HO:1)

	Step	Variable Entered Removed	F to enter or remove	Probability	Multiple R	R Square Change	R Square	Simple R	Overall F	Probability
READING	1.	Home-school relations	18.27	.000	.46	.21	.21	.46	18.27	.000
	2.	Instructional leadership	15.20	.000	.56	.31	.10	-.13	9.74	.003
MATHEMATICS	1.	Home-school Relations	8.80	.004	.34	.12	.12	.34	8.80	.004
	2.	Instructional leadership	16.69	.000	.58	.34	.22	-.31	21.84	.000
	3.	Environment	13.19	.000	.62	.38	.04	.30	4.63	.039
TOTAL	1.	Home-school Relations	13.61	.000	.41	.17	.17	.41	13.61	.000
	2.	Instructional leadership	16.41	.000	.58	.33	.16	-.23	16.16	.000

Relationship of Student Achievement and Demographic Variables (HO:2)

GCRT reading, GCRT mathematics, and GCRT combined scores were all statistically significantly correlated with the demographic variables of school size, socioeconomic status, and race. In addition, sex of principal was statistically correlated with GCRT mathematics. (See Table 3.)

Stepwise multiple regression analysis found a statistically significant correlation between socioeconomic status (free and reduced lunch), home-school relations, and race (minority) and GCRT reading. There was also a statistically significant multiple correlation between race (minority) and school and GCRT mathematics. A statistically significant multiple correlation existed between socioeconomic status (free and reduced lunch) and race (minority) and GCRT combined scores (See Table 4.)

Composite Relationship of Student Achievement with School Effectiveness Variables and Demographic Variables (HO:3)

A statistically significant multiple correlation existed between socioeconomic status (paid lunch), environment and GCRT reading. There was also a statistically significant multiple correlation between race (minority), home-school relations, instructional leadership and GCRT mathematics. Finally,

two combinations of school effectiveness and demographic variables were statistically significantly correlated with GCRT combined scores. The first combination was socioeconomic status (free and reduced lunch), race (minority), and home-school relations; the second combination was (race (minority), home-school relations, and instructional leadership. (See Table 5.)

Table 3

Pearson Correlations Between GCRT Scores and Demographic Variables (HO:2)

Demographic Variable	GCRT Reading	GCRT Mathematics	GCRT Combined
Size of school	.25 (p = .02)	.26 (p = .02)	.26 (p = .02)
Socioeconomic status (free & reduced lunch)	-.63 (p = .000)	-.56 (p = .000)	-.61 (p = .000)
Race (minority)	-.57 (p = .000)	-.61 (p = .000)	-.60 (p = .000)
Location	-.03 (p = .39)	-.03 (p = .41)	-.003 (p = .49)
Tenure of principal	-.23 (p = .03)	-.16 (p = .10)	-.20 (p = .06)
Sex of principal	.16 (p = .09)	.20 (p = .05)	.19 (p = .06)

Note: 1 tailed significance

Table 4

Stepwise Regression for Demographic Variables and GCRT Scores (HO:2)

	Step	Variable Entered	Removed	F to enter or remove	Probability	Multiple R	R Square Change	R Square	Simple R	Overall F	Probability
READING	1.	Socioeconomic status (free & reduced lunch		40.98	.000	.64	.41	.41	-.64	40.98	.000
MATHEMATICS	1.	Race (minority)		44.60	.000	.65	.43	.43	-.65	44.60	.000
	2.	Size		28.49	.000	.70	.49	.06	.23	7.53	.008
TOTAL	1.	Socioeconomic status (free & reduced lunch)		43.25	.000	.65	.42	.42	-.65	43.25	.000
	2.	Race (minority)		26.14	.000	.69	.47	.05	-.63	5.67	.020

Table 5

Stepwise Regression for School Effectiveness Variables, Demographic Variables and GCRT Scores (HO:3)

	Step	Variable Entered	Variable Removed	F to enter or remove	Probability	Multiple R	R Square Change	R Square	Simple R	Overall F	Probability
Mathematics	1.	Socioeconomic status (free & reduced lunch		40.98	.000	.64	.41	.41	-.64	40.98	.000
	2.	Home-school relations		25.93	.000	.68	.47	.06	.47	6.87	.011
	3.	Race (minority)		21.28	.000	.72	.52	.05	-.57	6.85	.011
Reading	1.	Race (minority)		44.60	.000	.65	.43	.43	-.65	44.60	.000
	2.	Home-school relations		26.86	.000	.70	.49	.06	.33	7.55	.007
	3.	Instructional leadership		28.12	.000	.77	.59	.10	-.32	13.97	.000
Total	1.	Socioeconomic status (free & reduced lunch)		43.25	.000	.65	.42	.42	-.65	43.25	.000
	2.	Race (minority)		26.14	.000	.69	.47	.05	-.63	5.67	.020
	3.	Home-school relations		21.73	.000	.73	.53	.06	.41	7.31	.009
	4.		socioeco-nomic status (free & reduced lunch)	30.56	.000	.71	.51	-.02	-.65	2.53	.119
	5.	Instructional leadership		25.27	.000	.75	.57	.06	-.21	7.73	.007

Conclusions

The findings of this study offer some support for previous research findings in the effective school movement. All of the significant correlations in this study between school climate variables and student achievement, however, were in the low range. The significant Pearson r coefficients ranged from a low of .20 (expectations for student achievement and GCRT combined) to a high of .46 (home-school relations and GCRT reading). Therefore, further research using similar methodology is needed to determine the validity of these results.

The first point to notice in the results is that not all of the independent variables were significantly correlated with student achievement. Although this study found fewer school effectiveness variables correlated with student achievement than most of the studies reported in the review of the literature, the findings of this study do corroborate the point that there is no magic list,

no formula of characteristics found in every effective school. Because of the people (teachers, administrators, support staff, and students) the physical condition of the school, and the community's attitude, economic condition, and educational background, each school has its own personality. It is, therefore, suggested that the staff of a school not merely adopt the findings of this or any study but rather examine the research carefully and determine what will work for their students, staff, and community.

The second point to keep in mind is that no one factor accounts for an effective school. Neither this study nor any of the studies reported in the review of the literature found only one variable associated with student achievement. As Robinson (1985) has pointed out, it takes many policies, behaviors, and attitudes working together to achieve success.

The low number of significant correlations may be attributed to the design of the research. One of the most common approaches used in the effective school movement has been to study outliers -- schools that score significantly higher or significantly lower on standardized tests. This study, on the other hand, analyzed schools from the full range of effectiveness categories (effective, average, ineffective). This inclusion of all scores and not merely the outliers may account for the paucity of significant correlations.

The strongest correlation with student achievement was with the variable of home-school relations which was significantly correlated with all three subgroups of the GCRT. As measured by the CSEO, this variable emphasizes monitoring of student homework by parents, parent-teacher conferences, communications between school and home, and school visitation by parents. It is important to note that the review of the literature found this to be one area where the evidence was not conclusive. This finding suggests the need for schools to work closely with parents. One possibility would be for schools to conduct a diagnostic survey (e. g., the CSEO) of their status and then to plan strategies for improvement. One suggested activity it recommends is a clear, well-publicized homework policy that includes close monitoring at home by the parents. Other activities include an active parent/school organization, parent-teacher conferences, home visits, phone calls, newsletters, regular notes from teachers, and parent-initiated visits to the school.

The second strongest correlation was with the variable of environment. As measured by the CSEO, this variable emphasizes an orderly, purposeful atmosphere free from the threat of physical harm, yet not oppressive and conducive to teaching and learning. This, too, is an area where schools can work for improvement. Several authors have offered suggestions for ways to improve the discipline of a school. They all emphasize that improvement depends on a high degree of involvement by the total school population, a careful assessment of current conditions, an organized plan of action, evaluation of the implementation, and continued effort.

Another finding of this study concerns the variable of instructional leadership. Contrary to previous research, this study found a negative correlation between instructional leadership and GCRT mathematics and GCRT combined scores. Previous research has found the principal to be the most important element for the improvement of student achievement.

This negative correlation of instructional leadership and student achievement may be, in part, due to the nature of the research. The questionnaire measured the variable at a particular point in time. It does not indicate trends. Perhaps the individuals leading the low achieving schools were selected for their positions because of their strong leadership abilities. The data indicate that the tenure for the principals in this study is only 6.11 years with a standard deviation of 4.78 years. The strong instructional leaders may not have been in their current positions long enough to effect the changes necessary for significant increases in student achievement.

The variable, expectations for student achievement, was significantly correlated with GCRT reading and GCRT combined scores. The total school climate was significantly correlated with GCRT reading. Although these correlations are statistically significant, there is no practical application of the findings. The highest of the correlations (total climate and GCRT reading) is .24. It should also be noted that the construct of High Expectations (which has less than six percent common variance with GCRT scores) had a reliability coefficient on the CSEQ of less than .70. Six percent of the variance of student achievement based on a construct of low reliability is not sufficient support for major changes in school climate.

Three of the seven school effectiveness variables were not significantly correlated with student achievement. Two of these variables, school-wide instructional goals and objectives and monitoring of student progress, had the highest means on the CSEQ. Because of Georgia's statewide testing program and an increased emphasis by the public on the importance of test scores, more schools than ever are carefully monitoring their students' progress and focusing their attention on coordinating the instructional program with the skills tested on the GCRT. Since the CSEQ measures the degree of implementation and not the quality of the activity, it was not possible to distinguish between those schools that were implementing these activities effectively and those that were not.

Classroom practices is the third variable to have no significant correlations with student achievement. There may be several reasons for this. First, there is no agreement among researchers that a particular curricular organization or instructional strategy is more effective than any other. The CSEQ stresses large group instruction. The schools in this study, on the other hand, may be using another approach with as much success. A second reason for the lack of a significant correlation may be that the activities suggested by this variable are also being widely implemented. For instance, the Georgia Board of Education has established a standard for all schools which limits the amount of time classes can be interrupted for nonacademic activities such as assemblies and pep rallies (one of the items measured on the CSEQ). Again, the CSEQ does not measure the quality of classroom instruction -- only the implementation of specific practices.

The results of the statistical analysis on the demographic variables are not at all surprising. Socioeconomic status and race consistently have shown strong correlations with student achievement. These are the kinds of findings that

Coleman et al. (1966) used to reach their conclusions that "schools bring little influence to bear on a child's achievement that is independent of his background and general social context" (p. 325). The results of this study, however, do not totally support these findings.

When school effectiveness variables were considered without the influence of demographic variables, stepwise multiple regression analysis indicated that two of them (home-school relations and instructional leadership) consistently accounted for more than 30 percent of the variance in GCRT scores in all three subgroups. When environment was added to the formula, the three variables accounted for 38 percent of the variance in GCRT mathematics scores. When the interaction of school effectiveness variables and demographic variables was considered, stepwise multiple regression analysis consistently showed that a demographic variable was most important to the formula although it was not the same variable for all three subgroups of the GCRT. What is important to note, though, is that with one exception the second and third variables to enter the formula were school effectiveness variables -- not demographic variables. Schools must not assume that certain students cannot achieve because of their race and/or socioeconomic status. Schools must work to overcome these "handicaps" and find those elements of school effectiveness that will give students a better chance to succeed.

The third demographic variable to produce significant correlations was size of school. As the size of the school increased, student achievement increased. The Quality Basic Education Act (QBE) puts heavy emphasis on increasing the size of schools and offers incentives to systems which consolidate schools to achieve a larger size. It should be noted that, although size of school was statistically significantly correlated with student achievement, the correlation is low. Less than seven percent of the variance in student achievement can be accounted for by considering the size of the school. The practical significance of this correlation is very low. School officials should look closely at other factors present in the locality before making any changes affecting school size.

A note of caution is in order. There is no clear pattern of interaction among the school effectiveness and demographic variables. The same variables are not present with each subgroup of the GCRT. It is encouraging to note, however, that, although the evidence is not conclusive, there do appear to be actions that schools can take to improve student achievement.

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